

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MR. J. E. S. MOORE has been elected to the chair of experimental and pathological cytology, recently established in the University of Liverpool by the Liverpool Cancer Research Committee.

A SERVICE for members of the University of London will be held in Westminster Abbey on Wednesday, May 8, presentation day, at 6 p.m. The Dean of Westminster has consented to preach the sermon.

PROF. M. D'OCAGNE, of the École des Ponts et Chaussées, will deliver in April, at the University of Paris, a free course of lectures on graphic calculus and nomography. In the second part he will give for the first time in a public lecture a complete account of his own methods on the subject.

MR. BIRRELL announced in the House of Commons on March 23 that the Treasury has agreed to place at the disposal of Ireland a sum of 40,000*l.* a year for a period of three years to assist to remedy the present disgraceful condition of Irish school buildings. There is no intention of stopping the grant at the end of three years, but it is felt, Mr. Birrell said, that 40,000*l.* is as much as can be spent profitably and usefully in a year.

WE have received an interesting description of the central electric power station of the Victoria Jubilee Technical Institute, Byculla, Bombay, which was opened by the Governor of Bombay on February 20. The installation, the first of its kind in India, is thoroughly up to date, and it is interesting to note that the erection of the boiler, engines, dynamo and motors, as well as all piping and wiring work, was carried out by the institute students.

IN the *Engineering Magazine* (vol. xxxii., No. 6) Commander W. F. Worthington discusses the United States Naval Academy as an engineering school. With the aid of numerous excellent photographs he shows the number, variety, and interesting character of the practical exercises, and expresses the opinion that the academy graduate at the end of a term of years after graduation should rank high among engineers of his own age from other schools, no matter what branch of the work he might take up.

A CIRCULATING library from which the most recent scientific and technical books may be obtained without trouble and at a moderate expense is a great convenience alike to teachers and students of science. Mr. H. K. Lewis, of Gower Street, London, W.C., has realised this fact, and his recently published list of medical and scientific books issued during the last quarter of 1906 shows that he makes every effort to keep his library up to date, and that the conditions under which books may be borrowed have been made as simple as possible.

IN connection with the Federal Educational Conference which the League of the Empire has arranged for May 24, the nature-study section intends to make (for the benefit of the colonial representatives) an exhibit typical of nature-study work in this country. The section will also meet during the week devoted to the conference, in order to discuss matters connected with the promotion of nature-study. Suggestions as to topics that might be considered should be sent to Mr. Wilfred Mark Webb (honorary secretary of the nature-study section), at Caxton Hall, Westminster.

THE organising committee of the International Congress for Hygiene and Demography, which is to be held in Berlin on September 23-29, is making arrangements to render it possible for members of the congress to visit the numerous hygienic institutions in and near Berlin. The meetings of sections will not be extended later than 2 o'clock, so as to leave the afternoons free for visiting. More than a hundred institutions will be thrown open to visitors, and a "Hygienic Guide" giving a short description of each of them in three languages is to be published, so that members of the congress will be assisted in choosing which institutions they will inspect. A local committee

composed of representatives of interested Imperial and State offices, the Berlin Council, and other bodies and societies, is actively engaged in preparing for the congress.

THE President of the Board of Agriculture and Fisheries has appointed a departmental committee to inquire as to the provision which has now been made for affording scientific and technical instruction in agriculture in England and Wales, and to report whether, in view of the practical results which have already been obtained, the existing facilities for the purpose are satisfactory and sufficient, and, if not, in what manner they may with advantage be modified or extended. The committee will be constituted as follows, *viz.*—Lord Reay (chairman), the Lord Barnard, Lord Moreton, Mr. F. D. Acland, M.P., Mr. D. Davies, M.P., Mr. N. Lamont, M.P., Mr. T. Latham, Mr. J. C. Medd, Prof. T. H. Middleton, Prof. W. Somerville, and Mr. H. Staveley-Hill, M.P. Mr. A. E. Brooke-Hunt, of the Board of Agriculture and Fisheries, will act as secretary, and Mr. H. L. French, of the Board of Agriculture and Fisheries, as assistant secretary to the committee.

THE general committee responsible for the arrangements in connection with the second International Congress on School Hygiene, to be held under the presidency of Sir Lauder Brunton in London next August, is sparing no pains to make the congress a complete success. A meeting to promote the interests of the congress was held on March 20 at the Mansion House, and was well attended. Sir Lauder Brunton explained the objects in view, and gave a detailed description of the groups of subjects to be considered by the congress. There will be eleven sections, as follows:—the physiology and psychology of educational methods and work; medical and hygienic inspection in school; the hygiene of the teaching profession; instruction in hygiene for teachers and scholars; physical education and training in personal hygiene; out-of-school hygiene and the relations of home and school; contagious diseases, ill-health, and other conditions affecting attendance; special schools for the feeble-minded; special schools for blind, deaf, dumb, crippled, and invalid; hygiene of residential schools; the school building and its equipment. Already the donations promised and received reach 927*l.* Further subscriptions are solicited, and should be sent to the treasurer, Sir Richard B. Martin, Bart., at the Congress Office, Royal Sanitary Institute, Margaret Street, London, W.

MR. MCKENNA, M.P., President of the Board of Education, was present at the annual dinner of old students of the Royal School of Mines on Tuesday, and in the course of a speech he made the announcement that the school is to retain its name and individuality in the Royal Technical Institute to be established at South Kensington. Mr. D. A. Louis presided at the dinner, and in proposing the toast of the evening, "Prosperity to the School of Mines," he said it is of vital importance that there should be a well-equipped national institution for the training of mining engineers, and that the institution should grant a distinctive diploma. The Royal School of Mines is such an institution; yet it has been proposed to relegate it to some hole-and-corner place in a big jumble of institutions which have nothing in common with it, excellent though they are in their own way. Mr. McKenna, in the course of his remarks, said that the school needs more and better equipment in order to provide it with the means of coping with rival institutions in various parts of the world. He hopes that in future the failure to make this provision will be remedied. In a memorial from past students of the Royal School of Mines to a departmental committee which inquired into the formation of the new technological college three requests were made, namely:—(1) that the title be retained as 'The Royal School of Mines'; (2) that the diploma of 'Associate of the Royal School of Mines' be retained as heretofore; (3) that the school, even though it may be affiliated to some central institution, be preserved as a separate entity as regards mining and metallurgical training with its own special staff and organisation." As an answer to these requests, Mr. McKenna read a paragraph from a draft of a charter, which may be issued hereafter. The clause states that "One of the

departments of instruction of the new institution shall provide specialised courses in mining and metallurgy, and that department shall be called and known by the name of 'The Royal School of Mines,' and the governing body shall award the diploma of 'Associate of the Royal School of Mines' to any student who completes such courses to the satisfaction of the governing body." The individuality and history of the school will thus be preserved, and will not be sacrificed in what the chairman called a jumble. In conclusion, Mr. McKenna expressed the hope that though, in joining a larger association, the school necessarily will sacrifice a certain amount of individuality as a governing body, nevertheless by retaining the name and the diploma it will be compensated for any respect in which it may suffer by the advantages which will accrue from the fuller and more complete equipment. The name and the fame of the Royal School of Mines must be kept bright as a star in the firmament of the new institution, which is to be a pioneer even to Germany in the work of scientific training

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 13, 1906.—"An Examination of the Lighter Constituents of Air." By J. E. COATES. Communicated by Sir William Ramsay, F.R.S.

About 73,000 litres of air were systematically fractionated in order to ascertain whether any constituent lighter than hydrogen (e.g. coronium) were present. A preliminary concentration of the lighter portions was effected by collecting the gas which had passed repeatedly through an air-liquefying plant, precautions being taken to avoid contamination of the gas with hydrogen. By fractionation of the liquefied gas, a light portion having a volume of about 4700 c.c. was obtained, which was further fractionated by absorption in charcoal at about -205° C. The lightest fractions thus obtained were examined spectroscopically, but no lines were detected which could not be attributed to hydrogen, helium, and neon. The volume of hydrogen amounted to 0.778 c.c., while the total volume of neon and helium obtained was 46 c.c. Assuming that 60,000 volumes of air contain one volume of mixed neon and helium, it appears that hydrogen is present in the air to the extent of one part in about a million and a half. This estimate has been subjected to a correction for the solubility of hydrogen in liquid air, an approximate correcting factor being obtained by performing the fractionations on a sample of air to which a known small quantity of hydrogen had been added. This is much smaller than previous estimates; it seems probable that hydrogen is a variable constituent of the atmosphere.

January 31.—"A Recording Calorimeter for Explosions." By Prof. Bertram HOPKINSON. Communicated by Prof. H. L. Callendar, F.R.S.

This paper describes a method of recording the heat lost up to any instant after an explosion of coal-gas and air in a closed vessel. For this purpose the vessel, which was cylindrical, and about 1 foot in diameter and 1 foot long, was lined first with a wooden backing $\frac{1}{4}$ -inch thick and then with a continuous length of copper strip $\frac{1}{4}$ -inch wide by $\frac{1}{25}$ -inch thick. The strip was wound helically on the cylindrical part of the vessel, and the two end-plates were covered with parallel pieces joined up at the ends so as to form an electrically continuous length.

The method consists in recording the rise of resistance of the whole length of copper strip when the explosion takes place. The rise of resistance is proportional to the rise of mean temperature of the strip. Hence, knowing the heat capacity of the copper, the total heat that has passed into it at any instant can be obtained from the record, after making certain corrections for the heat which has passed from the copper into the backing and into those parts of the walls which are not protected by the copper.

The record of resistance was obtained by passing a known current (about 8 amperes) through the strip, and recording the potential at the terminals of the strip by means of a reflecting galvanometer having a period of

about $1/15$ th of a second. The galvanometer was placed in series with a constant source of E.M.F. of such magnitude as to balance the E.M.F. at the terminals of the strip when cold; the galvanometer deflection was then proportional to the rise of E.M.F. between the terminals of the strip, and so to the rise of resistance. The galvanometer mirror reflected an image of a fine hole illuminated by an arc lamp on to a photographic film carried on a revolving drum. A photographic record of the pressure in the vessel was obtained at the same time on the same film.

The mixture used consisted of one part of coal-gas and about seven parts of air at atmospheric pressure and temperature. It was fired by an electric spark at the centre of the vessel. To test the accuracy of the calorimeter, the heat which had passed into the walls at the end of one second from firing was calculated from the record, and was found to be 10,000 calories. The temperature of the gas at that moment was found from the pressure record to be 545° C. Using Holborn and Austin's values for the specific heats of the constituents up to that temperature, the heat remaining in the gas was calculated to be 3800 calories. The total heat accounted for by the calorimeter and pressure records is therefore 13,800 calories, and this should be equal to the heat of combustion of the coal-gas used. This was the case within 2 per cent.

The calorimeter record shows that during about two-fifths of a second after firing the rate of heat loss to the walls at any moment is approximately inversely proportional to the square root of the time. That is, the law of heat loss is initially the same as that of a solid at uniform temperature the boundary of which is suddenly cooled. It is pointed out that the rate of cooling is conditioned mainly by the state of the surface layer of gas in contact with the walls; at first heat is drawn from that layer, and the loss of heat is very rapid, but when the surface layer has been cooled down it acts as heat insulation for the remainder, and further cooling is relatively slow.

Linnean Society, February 21.—Prof. W. A. Herdman, F.R.S., president, in the chair.—The Percy Sladen Trust Expedition to the Indian Ocean in 1905 under Mr. J. Stanley Gardiner. (1) Description of the expedition. (i.) Introduction; (ii.) history and equipment of the expedition; (iii.) résumé of the voyage and work. Part i., Colombo to Mauritius: J. Stanley **Gardiner** and C. Foster **Cooper**.—(2) Land nemerteans, with a note on the distribution of the group: R. C. **Punnett**. A single land nemertean obtained by Mr. Stanley Gardiner in the Seychelles must be referred to a new species, and has accordingly been named *Geonemertes arboricola*. The specific name has reference to the peculiar habitat of the worm, which occurs, among other places, in the leaf-bases of the screw-pine, *Pandanus hornei*.—(3) Land Crustacea: L. A. **Borradaile**. The collection contained thirty species, belonging to eleven genera. None were new to science, and all had previously been reported from the Indian Ocean. The fauna revealed by the collection is richer than that of the Maldives and Laccadives, but otherwise closely resembles it.—(4) Hymenoptera: P. **Cameron**. Thirty-two species of the group were obtained, ants being excepted. Of these, seventeen are described as new, one, *Tolbia scaevola*, as the type of a new genus. Ten species were obtained from the Chagos, three being new; and twenty-three from the Seychelles, including Coetivy, eleven new, the fauna for this archipelago now consisting of twenty-four species. As regards the habits of the species, it is suggestive that so many of them belong to genera (*Evania*, *Ampulex*, *Sphex*, *Notogonia*, &c.) of which many, if not most, of the species prey on Orthoptera.—(5) Dragon-flies: F. F. **Laidlaw**. The collection contains fourteen species, none of which are new. All were obtained in the Seychelles, and four in the Chagos as well. It is suggested that the species peculiar to the Seychelles are a fragment of an endemic fauna which is being displaced throughout the whole Indo-African region by an invading fauna from the north.—(6) Fourmis des Seychelles, Amirantes, Farquhar et Chagos, déterminées par H. A. **Forel**. Nous avons pour les divers groupes d'îles en question 8 espèces cosmopolites, 8 espèces malgaches,